MOLYBDENITE CONCENTRATIONS IN THE RIO DE JANEIRO STATE, BRAZIL

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ABSTRACT: Molybdenite described in the Rio de Janeiro State particularly at the City of Rio de Janeiro as well, since the beginning of the last century, occurring in pegmatites along with abundant magnetite, black tourmaline, zircon, allanite, rutile, pyrite, apatite, beryl, monazite, ilmenite and garnet. The objective of present communication is to describe the molybdenite occurrences, discuss its geochemical control and genetic aspect. The main minerals of pegmatites occurring in regular amounts are quartz, microcline, orthoclase, plagioclase, black biotite, hornblende, epidote and rare muscovite with extremely rare pollucite. These rocks crosscut gneisses and granites, which constitute several types, markedly biotite gneiss, plagioclase gneiss, leptinite and microcline gneiss. The pegmatite varies between a few centimeters up to 5 meter thick being mostly concordant with the foliation of the gneisses but appear discordantly. Some pegmatites are zoned with biotite concentrated at the margins and microcline close to the core. Magnetite and some opaque minerals follow and are included in biotite as well as molybdenite. Molybdenum, together with other transition elements shows a direct relation to uranium-coal and carbonaceous clayey siltstone and concentrates in granites, alkaline massifs and particular zones within biotite gneiss, greater than crustal abundance. Highest Mo-contents recorded in rhyolites (0.6-5 ppm), quartz diorite (0.2-3.2 ppm) in granitic rocks and in carbonatites when the values reach 50 ppm (10-100 ppm). It is also remarkable that molybdenum added to circulating ground water in order to reduce pH of the sediments. No molybdenum deposits is associated with in calcic magma series. Reactions involving molybdenite in equilibrium with biotite, K-feldspar, garnet and muscovite represented in chemical potential diagram (μH^+-μH_2S) suggested that molybdenite is stable under alkaline conditions, as happens in alkaline-carbonatitic complex. Molybdenite occurrences in Rio de Janeiro State documented through several instances, besides sulfidic mineralizations is relatively ubiquitous. The presence of pyrite in most of overall biotite gneiss in bands, schlierens, boudins and druses with pyrite and calcite in constriction and pressure shadow zones reveals that the fluids changed their composition passing from an aqueous state to a relative enrichment of CO_2 and H_2S, allowing molybdenite formation as long as the concentration of Mo increases and Fe diminishes or leaves the system. A mineralized skarn with pyrite deposit about 6 km along main foliation among Rio Claro and Lídice constitutes a Meridional Belt which contains Zn-Pb (quartz-pyrite-pyrrhotite-galena-sphalerite-sphene-rutile-calcite-graphite) mostly concentrated in Paraguai Creek; pyrrhotite, pyrite, chalcopyrite, graphite and sphalerite at Colenga; pyrite, pyrrhotite, sphalerite, galena and graphite. Rio-das-Canoas at Volta Brava pyrite, pyrrhotite, sphalerite, galena and graphite; and pyrrhotite, pyrite, galena, sphalerite and graphite at Passa Dezoito where the diopside-calcite-quartz-epidote and hornfelses with biotite, K-feldspar, and graphitic cordierite skarn are partly mineralized. Some disseminated graphite has been found in Passa Dezoito. A pegmatite with fissured rose K-feldspar contain biotite, molybdenite and magnetite, reflecting the chemical dependence and late crystallization.

KEY WORDS: CHEMICAL POTENTIAL, MOLYBDENITE, PEGMATITE.